

NORTH CAROLINA

AGRICULTURAL EXPERIMENT STATION

OF THE

**COLLEGE OF AGRICULTURE AND
MECHANIC ARTS**

WEST RALEIGH

SHEEP RAISING

N. C. COLLEGE OF AGRICULTURE AND MECHANIC ARTS

THE NORTH CAROLINA

AGRICULTURAL EXPERIMENT STATION

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Visitors are at all times cordially invited to inspect the work of the Station, the office of which is in the new Agricultural Building of the College.

Address all communications to

N. C. AGRICULTURAL EXPERIMENT STATION,
WEST RALEIGH, N. C.

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SHEEP RAISING.

BY R. S. CURTIS.

Adaptability of State to Sheep.

The sheep industry of North Carolina as now conducted represents one of the most backward and the least profitable lines of live stock husbandry followed in the State. The eastern portion of the State is not generally well adapted to growing this class of animals, however, on well drained farms under the most favorable conditions, the industry may be followed with quite satisfactory results. In the Piedmont section there is no doubt but what a large part of its waste land could be used profitably for grazing sheep. Much of the hill and valley land now covered with coarse grasses and forest undergrowth would all furnish a large amount of pasture, and at the same time the land would be greatly improved in agricultural value. The western portion of the State, including the mountains and the upper Piedmont, are by far the best adapted of any section to sheep farming. This is true for two reasons chiefly: First, because of the high well drained pastures, thus giving comparative freedom from parasites, and second, because of the better natural grazing conditions. While it may be argued by some that the latter is unfortunate from the greater danger of the ravages of the stomach worm, yet from the standpoint of economical grazing this is not true. The stomach worm no doubt does a great deal of injury to sheep grown in this section, yet by proper pasturage methods a large percentage of this loss could be avoided. From the standpoint of soil, climatic and pasturage conditions no section of country could be better adapted to sheep than western North Carolina. While at present considerable portions of the rough land are utilized for cattle grazing there is still large areas of the rougher portions entirely unsuited to cattle which could be profitably used for sheep grazing. Even a great deal of that now used by cattle could be more profitably utilized in the production of sheep. For the amount of money invested and the quantity of feed required it is believed this class of animals will generally return a greater net profit than most any other kind of livestock that may be grown in the State.

Condition of Sheep Industry.

Two of the chief reasons for the scarcity of sheep are the presence of the cur dog, and the ravages of the stomach worm. There is no doubt but what great benefit would accrue to the farmers of the State if something were done to eliminate sheep-killing dogs, however, sheep may be raised profitably regardless of these enemies. Extra precaution to guard the flock from dogs, although it increases the cost of keep somewhat, will repay the farmer, providing the flock has been managed properly otherwise. Change of pasture is the most practical means of overcoming the ravages of stomach worms, which are especially dangerous to young lambs.

With the exception of a few sheep grazed on mountain pastures the writer is unable to locate any in the State except scattering flocks owned by some of the more progressive farmers in the Coastal Plain and Piedmont sections. Unlike the hog, a few of which are found on almost every farm, sheep are rarely given consideration. There are very few pure bred flocks in the State, the majority of them being crosses of various mongrel types. In the mountain pastures there is a reason for this condition existing since the character of the grazing land makes it impractical in many instances for the sheepman to give his animals daily attention. Even here, however, where pure breeds have been tried, they have proved highly satisfactory. Sufficient evidence has



FIG. 1—A flock of Western North Carolina ewes.

been obtained to show that many of the reasons given for not raising sheep are not well founded. Fair trials have shown that there is a place for improved sheep in the State. There is no good reason why the farms of the State should not support more than 214,000 sheep as at present, this representing only about one animal to every 146 acres, or an average of less than one sheep to each averaged-sized farm.

Briefly stated, the sheep industry is seriously neglected, although it is an occupation with great possibilities when handled properly. Even the use of a purebred ram would soon greatly improve upon the ewes seen in many of the farm flocks. The improvement that can be made upon ordinary ewes which can be purchased usually for three to four dollars per head would surprise the beginner and inspire confidence in the possibilities of the sheep business.

Adaptation of Breeds.

Naturally sheep are at home on high, dry and well drained lands. While the traits and characteristics of most breeds differ somewhat, and in some cases quite widely, it may be safely said that as long as sheep are kept on high and dry land, clean and well nourished, there is little likelihood of trouble. As an example of the peculiar traits of different breeds the Shropshire might be mentioned as a breed which is peculiarly adapted to the conditions existing on farms where natural pastures abound. The Black Faced Highland sheep are entirely different, choosing for their home some of the steepest cliffs on the mountain sides where a livelihood would seem well-nigh impossible. The Cheviot, while adapted to mountain conditions, does not choose the steepest and most rugged mountain sides like the Black Faced Highlands, but rather a more moderate condition of hills and cliffs. The Tunis on the other hand is well adapted to the lower and more level lands and to a warm climate, such as exists near the deserts of Africa, the native home of this breed. They can withstand more in this respect possibly than any other breed although like most other breeds they will thrive better under more favorable conditions of soil and climate.

Many other breeds might be mentioned, each having their own peculiar traits and characteristics. Sheep do not like wet feet, or foul places for feeding and sheltering. Such conditions are sure to bring on trouble and discouragement. Whatever the breed selected the animals should be given the high and well-drained places rather than the lower undrained fields. Under the latter condition troubles are likely to multiply either from intestinal worms, from diseases of the feet, or from constitutional ailments.

Sheep being ruminating animals can subsist largely on the coarser roughage feeds of the farm. They are great weed destroyers, often gaining a large part of their livelihood thereby, but they can not be grown to the best advantage without the addition of some concentrates during the winter or when on poor pasturage.

Sheep as Soil Improvers.

It is universally accepted that sheep droppings under like conditions contain a larger amount of fertility than that from either the horse, cow, or hog. One of the desirable features of this product is the uniform distribution made by the sheep over the land. In the leading European countries, such as England, Scotland, France, and Germany, the value of sheep in improving impoverished or naturally thin soils has been recognized for centuries. It is stated on good authority that many of the soils would be almost worthless but for the fact that they are densely covered with sheep. In these countries flocks of sheep aggregating two or three thousand in number are not uncommonly seen. The various breeds which naturally inhabit the rough mountain lands, and the precipitous cliffs of these countries, where only scanty and coarse herbage exists, manifest their great value in making otherwise worthless land bring in profitable returns.

Much of the gullied land and waste hillsides of this State could be utilized profitably in the production of sheep. Prominent farmers in the State have proved this to their highest satisfaction. Much of the

land which now grows reeds and other coarse herbage can be restored to profitable tillage by the use of sheep. Fortunately the sheep is a ruminating animal and with the compound stomach can make use of much of the coarse grass and weeds which thrive on these depleted soils. In European countries where sheep raising is carried on extensively and usually profitably very little concentrated feed is used, except through the flushing and lambing season. During other periods hay, grass and roots form their mainstay. Any farmer who is willing to give to sheep the same amount of intelligent care that he gives to other livestock will find them not only profitable, but good soil improvers, bringing into cultivation large areas of otherwise waste land.

Important Breeds of Sheep.

Breeds of sheep are very numerous, these being adapted to a wide range of conditions, including the mountains, plateaus, and lowlands, with their varying degrees of moisture, temperature, and pasture conditions. The writer will only make mention of the types and important breeds giving a brief note regarding their adaptation. The following outline embraces these breeds showing their classification on a basis of wool and mutton types.

1. *Fine Wool Type*—

Wool Production.

American Merino.

Delaine Merino.

Rambouillet.

2. *Medium Wool Type*—

Mutton Production.

Shropshire.

Southdown.

Hampshire.

Oxford.

Suffolk.

Dorset Horn.

Cheviot.

Tunis.

3. *Long or Coarse Wool Type*—

Mutton Production.

Lincoln.

Leicester.

Cotswold.

Kent or Romney Marsh.

While there are a few other breeds of sheep gaining greatly in favor in this country the classification just given embraces those now most universally accepted to be of standard type.

The fine wool type is used largely on the range for foundation flocks for lamb and mutton production and in those countries where fine wool growing is made a specialty, notably in Australia.

The medium wool class represents the average in length and fineness of wool, and is the type used largely for mutton production on arable

farms, although this does not represent their limit of usefulness. The breeds of this class are generally adapted to the conditions of this State, however, in the mountains Merinos are quite largely used.

The long wool type includes the large breeds having long and rather coarse, and open fleeces. They have not been used in the south to any considerable extent, as large breeds would not do well either in the rough mountainous section or even on level farms where pasture was not naturally available.

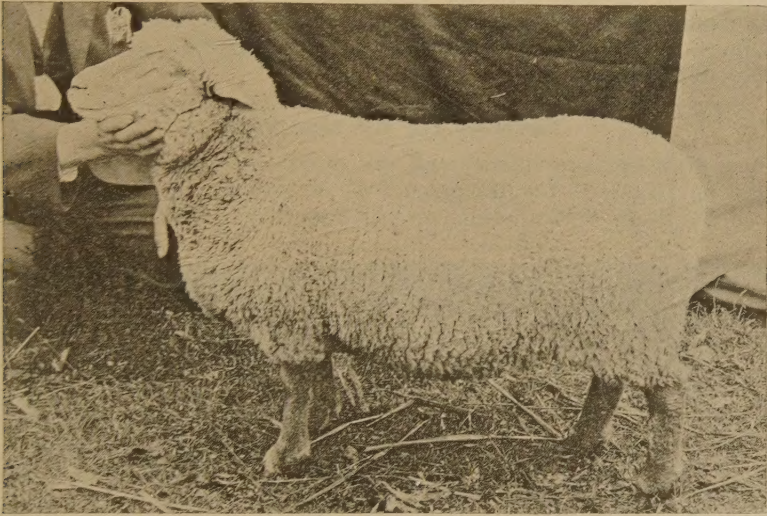


FIG. 2.—A Southdown ewe from the mountainous section.

Of the breeds mentioned the Shropshires, Southdowns, Hampshires, Dorset Horns and Merinos are most popular in the State. They are all of medium weight and are good mutton producers with the exception of the Merinos which are used somewhat in the mountains of the State where the range conditions makes them of special value owing to the close, compact nature of their wool. Full or half-breeds of this type, especially when bred to rams of the mutton type, produce excellent lambs. This practice is followed very largely on the large sheep ranges of the west.

Feeds for Sheep.

In England and Scotland, in fact in most foreign countries, the ration of the flock is composed primarily of coarse feeds except during the lambing season and during the latter stages of pregnancy. Many of the rough feeds produced on the farm and the common weeds which infest the fields will be eaten readily by sheep. Hay, especially that made from the legumes, is well suited to them. Leguminous hay with the addition of concentrates in small quantities will carry a flock of ewes through the winter. Corn silage and annual pasture crops are all valuable.

The concentrates ordinarily used for sheep are corn, oats, soy beans, wheat bran, linseed meal and cottonseed meal. While the latter feed

has not been used extensively in sheep feeding there are considerable data to show that it is a valuable feed for this purpose.

In the South where the grazing season is long and where so many annual crops can be grown and consumed both in the green and mature stage, there are exceptional advantages in sheep farming. Corn silage will take the place of roots, which are used very extensively by the English and Scotch flockmasters. The many weeds and coarse grasses annually growing in this section may be converted into money through sheep, and at the same time add yearly to the value of the land from the manure produced. These rough feeds and grasses should be utilized, and there is nothing more profitable in so doing than by the use of a healthy flock of ewes.

Pasturage and Succulent Feeds.

During the spring, summer and fall annual grazing crops can be depended on largely to furnish green feed for sheep. In the western portion of the State where permanent pastures thrive, they will be of great

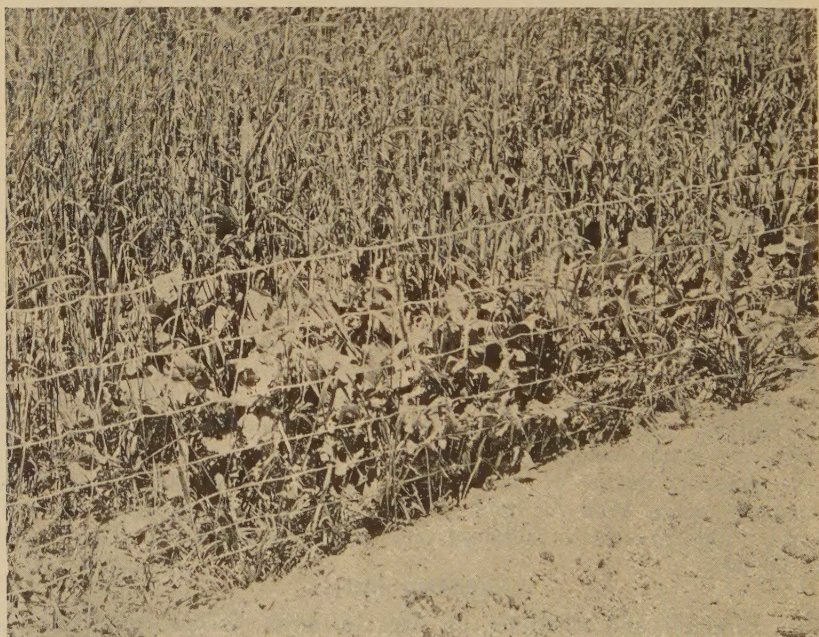


FIG. 3. A field of rye and rape for sheep pasturage.

value in the economical production of sheep. During the winter a combination of grazing crops, and corn silage on farms where the latter is produced, will materially reduce the cost of maintenance. Rape should be included in the dietary. It is greatly relished by sheep and will furnish an abundance of green feed. However, it can be grown successfully only on fertile or well manured and carefully prepared land.

The following rotation is suggestive of what may be grown for sheep

in this state. The particular crops produced will depend on the section in which the farmer resides. Some of the crops in the list may be unimportant in some sections, but they are mentioned for those who may be unable to grow the more important ones.

ANNUAL FORAGE CROPS FOR SHEEP.

Kind of Forage.	Amount of Seed per Acre.	Date of Seeding.	Period of Grazing.
Rape	3 pounds drilled 6 pounds broadcast	August 15 to May 1	Eight to ten weeks from seeding
Cowpeas	1 to 1½ bushels	May 15 to July 15	July 10 to October 15
Soy Beans	1 bushel	May 15 to July 15	July 15 to October 15
Canada Field Peas and Oats	1 bushel 1 bushel	February 15 to March 15	April 20 to June 15
Oats and Vetch	1½ bushels ½ bushel	August 10 to October 1	November 15 to April 20
Rye and Crimson Clover	1 bushel 15 pounds	August 1 to October 1	November 15 to April 25
Oats	1½ to 2 bushels	September 10 to November 15	November 1 to July 15
Wheat	1½ bushels	September 15 to December 1	November 20 to July 15
Rye	1½ bushels	August 1 to December 1	October 1 to April 20
Alfalfa	30 pounds	September 1 to October 15	May 20 to September 20
Red Clover	15 pounds	September 10 to October 15	April 1 to June 15
Japan Clover	25 pounds	April 1 to May 15	June 1 to September 15
Bermuda Grass	Rootstalks every second round of plow	March 15 to May 15	June 1 to September 15
Mangels or Stock Beets	6 to 8 pounds	April 20 to May 15	October 15 to March 1
Burr Clover	10 pounds clean 40 pounds burr	September 1 to October 1	December 1 to March 1

Shelter for Sheep.

Ordinarily the wool of sheep is a protection from cold, however, when they become wet through exposure to rain or storms it is likely to cause serious trouble. Aside from this need for shelter sheep could depend largely on a hillside or cove for protection. The buildings should be simple, durable and ample means should be provided for ventilation



FIG. 4—A typical Shropshire ewe and ram.

and cleanliness. Sunshine in the buildings is important in order to keep them dry and thoroughly disinfected.

During the lambing season it will be necessary to take extra care with the flock. At this season the quarters should be adequate to provide for every need, although this does not necessitate expensive buildings.

Starting a Flock.

Pure Bred Flock.—In starting into the breeding of pure bred sheep the prospective breeder should first select the breed best adapted to his conditions, and then make selections from the flock of a breeder who has good stock for sale at reasonable prices. Many buyers make the mistake of purchasing sheep which are possibly off in type and condition, simply because they are cheap. If the purpose is to work eventually into the breeding of fancy stock the best is none too good. The writer believes it advisable to purchase a small number and secure animals which are of the best type and breeding. As sheep multiply rapidly, it will only be a short time until the flock will be doubled or trebled in numbers.

The thing of most importance is to decide definitely on the breed and then study the best type of that breed thoroughly before purchasing. No more ruinous policy could be followed than to select a flock of sheep off in type and attempt to make a successful show at a fair or exhibition. A few good ones will soon advertise the business until the demand for breeding stock will afford going into it more extensively.

Two plans may be followed in purchasing animals as a foundation for a flock. A ram and the unbred ewes may be purchased, or bred ewes may be secured late in the fall, after the breeding season is over. By following the latter plan the ewes will cost more, but if proper selections are made the buyer will have an opportunity to get in the lambs from the bred ewes some blood of the more noted sires.

For Market Purposes.—In purchasing for market purposes the conditions will be quite different. It should be decided what kind of sheep is in demand. If winter lambs can be disposed of profitably it may be that this business could be followed to advantage. The most important breeds having the early breeding habit are the Merinos, Hampshires, Dorsets, and Tunis. If it is the intention to breed winter lambs some one of these breeds or their grades should be secured. However, the strictly winter or hot-house lamb business requires greater skill than is required in raising early spring lambs by ordinary methods.

No matter what type of lamb is to be produced the sire should be pure-bred and should be of excellent individuality, as an animal of this character will be better able to impress his characteristics on the varying types of ewes selected to form the foundation flock.

Quite satisfactory results can be secured in raising market lambs by using grade mountain ewes, but care should be taken in selecting them. Only those which exhibit maternal qualities such as femininity, vigor and capacity should be selected. Upstanding, rangy ewes should be avoided. Those secured should be low-set and of good length and depth. Broken-mouthed ewes should never be purchased for this purpose, as they can not properly nourish themselves or their lambs. Every precaution should be taken to secure clean, healthy ewes which will by the use of a

prepotent sire bring strong, healthy lambs. The best ewe lambs may be retained each year, and in this way the breeding flock may be gradually raised to a high standard.

Period of Usefulness.

The period of service of sheep should be governed by the returns from the flock. As long as the ram is active and continues to get a good percentage of lambs, there is no valid reason for discarding him. The same may be said of the ewes. Tried and proved matrons are always worth more than untried ones.

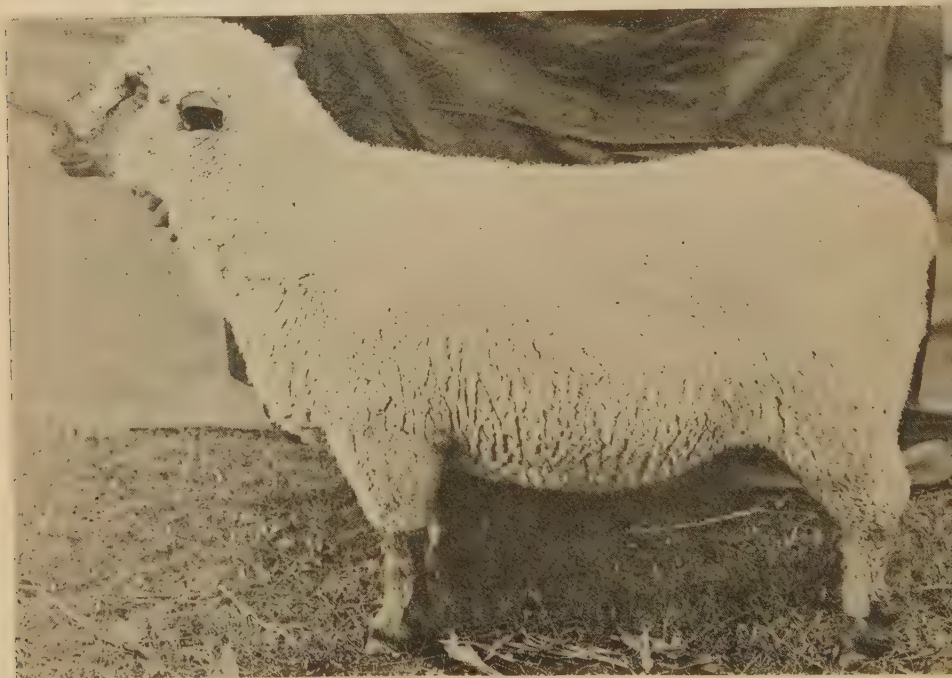


FIG. 5—A Western North Carolina Hampshire ram in field condition.

The loss of teeth and improperly nourished lambs resulting therefrom is one of the first things which will be noticed. When such a condition arises the ewes should be fattened for market. In a small flock the period of service of the ram will be limited to two or three years, because of inbreeding if he is retained longer. In larger flocks this condition can be remedied by changing him to a new flock of ewes. The ewes themselves should be retained as long as they are sure and profitable breeders. It is not an uncommon thing to get five or six crops of lambs from a single female. Some breeders follow the practice of breeding the females for about four years, after which they are turned with the ram and sold at the close of the breeding season. While these older ewes may take more care if one crop of lambs can be gotten from them, it will enable the purchaser to get an economical start in pure bred sheep.

Selection of Ram.

The ram should be selected with the greatest care. The nearer his individuality is to the recognized standard in type and breed, the more satisfactorily will he overcome any variation in the ewes. This is very important, either with pure-bred females or with the grade flock.

The ram should be selected from a flock of high standard. Conformity to breed type is always important. In the individual, the masculinity, style, vigor, form, quality and wooling should all receive attention. Masculinity should always be evident in a sire, yet coarseness of quality and absence of breeding should not be mistaken for this. The ram should be bold, stylish and vigorous throughout. Style is indicated by the bold carriage of head, and spright, vigorous movements of the animal. A dull, sleepy animal should never be considered for the head of a flock. Such would lead generally to weakness in the lambs. Vigor is shown in the bright eye, the robust frame, the strong full head, the full deep chest and capacious barrel. Good digestive powers such as are indicated here bespeak a rather long period of usefulness.

The form should be square, the ribs well sprung, the body deep, having width and length in proportion. Quality or fineness of structure is a very important factor in considering the purchase of a sire. It is probable that no other point is so hard to explain, yet it is easily seen by the experienced eye. The lines of the animal should be clear cut throughout, the skin clean, pink in color, and the wool bright and lustrous. The plain headed ram with coarse features indicates absence of quality and should be avoided as he is sure to transmit the same characteristics to the offspring.

Selection of Ewes.

The ewes should be selected from a utility standpoint. The show animal which presents the pleasing appearance in the ring will not always do well under field conditions, especially in this State. This type of animal because of the pampered condition will not make the most useful breeder. Ewes which have been reared under natural farm conditions will always be more profitable. This does not mean, however, that the animal of pleasing lines should be disregarded entirely.

The ewe should be strikingly feminine in appearance, yet a weak undersized, over-refined animal should not be mistakenly selected for one having this quality. The masculine appearing female should be avoided. A roomy, capacious ewe should never be passed for one with a tucked-in body, as she will seldom prove to be a satisfactory breeder. A low-set ewe having a long, deep and full body with a good leg of mutton, is the desirable type to breed from for the production of field sheep, as a goodly percentage of vigorous lambs is the main object in view with the general farmer.

It will depend somewhat on the breed selected as to the size and type of the animal, however, in general the points mentioned will be important no matter what the breed may be. Unless the farmer is growing his own supply of females for replenishing the flock, he will likely find opportunities to purchase grade ewes from farmers discontinuing the business, or from some of the local or central stock markets. Every precaution should be taken to get healthy ewes, well woolled, of good

form with healthy udders and sound teeth, showing them to be not over two, three, or four years old at most. In the pure-bred business there will be a better opportunity to select choice ewes, although they will cost considerably more than the grades. The breeding flock should be uniform in weight and type, since these qualities transmitted will add greatly to the value of the offspring.

If pure-breds are to be used in starting the flock it will be advisable to buy from parties who are conservative in the claims for their ewes. A great many times fancy prices are paid for pure-bred sheep when better ones could have been procured for probably one-half or two-thirds the amount of money.

Only strong, healthy, capacious ewes of uniform type and wooling should be selected. A broken-down ewe with a scant milk supply is of no value whatever in the flock.

Age to Breed Ram.

As a general thing sheep are bred too early in life for the most satisfactory results. The ram is often bred to a flock of ewes in the fall following birth, a practice which should never be followed except by experienced sheep breeders. Under no circumstances should the ram be bred before he is a year old and better still not until the second fall, when he will be from eighteen to twenty months old. Some breeders will not use a ram heavily even at this age. Ram lambs put into service too early can never reach their natural size nor attain their normal thrift and vigor. While the ram has a very strong reproductive system, early abuse will render him impotent and unprofitable. Proper feeding is far more important during the early stage than the production of a crop of lambs. During an emergency a very early lamb may be used in the fall on a few ewes, but the practice generally leads to excessive service and eventually a very unsatisfactory breeder. The ram is naturally a vigorous animal but early breeding will be sure to cause a much shorter period of usefulness.

Age to Breed Ewe.

A great many breeders follow the practice of breeding lambs at eight and ten months of age, but the most successful flock-masters will allow the females to more nearly approach maturity. With the male the service can be regulated, starting with a few services well distributed, but with the female the burden of maternity is thrust upon her at once. For this reason the extra burden of reproduction should not be allowed to hold in check her natural maturity. If the ewe is not bred until after she is a year old the results will generally be more satisfactory. It will depend somewhat on the size and vigor of ewes just what plan will be best to follow, as size and development should be the principal determining factors when the ewes should be bred. The practice of breeding ewe lambs will steadily and persistently decrease the size of the animals in the flock, which an experienced flock master will not tolerate. The ewe lamb should be fed judiciously and allowed plenty of exercise. By so doing and withholding them from the ram until well matured they will, when placed in the breeding pens, more than make up for the apparent loss.

If the ewe lambs are bred it will cause them to come in heat later and later each season, thus making a crop of lambs which is very undesirable, especially in sections in which the stomach worm is prevalent. The vitality of the ewe will also be prematurely sapped by breeding too young, thereby rendering her much less valuable at maturity.

Care and Management of the Breeding Flock.

The breeding flock demands close attention, yet not more than any other class of breeding animals should have for the most satisfactory results. Regular care, uniform feeding, abundant exercise, and succulent feeds are essential for success. Frequent examinations are advisable to determine if any of the diseases peculiar to sheep are in evidence. Sheep are not heavy feeders, but they should receive their



FIG. 6. A flock of ewes on a farm in the Piedmont section.

rations regularly, especially when they do not have access to pasture. During the summer months after the lambs are weaned, if pasture can be provided little else need be given until just prior to the breeding season, when the ewes should be fed grain somewhat heavier than usual. If ewes are gaining in flesh steadily during the breeding season they conceive more readily and have a better opportunity to care for the fetus through the extra flesh which they carry. After the breeding season is over pastures will soon begin to deteriorate. If corn silage can be had it will be valuable for keeping the ewes in that vigorous condition which fits them for the lambing season. Dry feeds at this time are undesirable, especially if they are inclined to be too carbonaceous in character.

If good roughages can be obtained, such as cowpea, clover or oat hay, the concentrates may be fed rather sparingly, however, if the roughage is of poor quality more and better concentrates should be given. The English method is to supply roots during the winter season and these, with the dry roughages given, constitute largely the daily ration. However, in this country roots are not extensively grown on account of the extra labor and cost, but corn silage may be very successfully substituted.

In the early spring preparation must be made for the lambing season. Feeds of a nitrogenous character and cooling in effect should be given at this time. Dry fattening feeds should be avoided, and those of a succulent character should be given instead largely. The ewes should not be closely coralled, but should be given plenty of range, which will tend to keep the system in a strong healthy condition.

The ewe barn should be large and well ventilated. If these things are provided and the health of the flock is looked after properly, there need be little cause for not making the sheep business a success.

Period of Gestation and Heat.

The period of gestation is about one hundred and fifty days or five months approximately. The time may vary considerably, but on the average the above is correct.

Normally ewes breed during the fall months and lamb in the spring. Some breeds, however, will conceive much earlier so that the lambs come during the winter season. During the breeding season the ewe comes in heat every three weeks and remains in this condition for three to four days.

Breeding.

The breeding season usually begins in July and continues until late in the fall. The Dorsets, Merinos, Tunis and Hampshires breed earlier in the season than most other breeds. The Shropshire and Southdown, for example, conceive somewhat later and the long wool breeds still later, the latter lambing usually in March or April. Ordinarily under the conditions in this State, the lambs can be made to come quite early in the spring. This is most advisable for warding off the ravages of the stomach worm.

Two practices may be followed in breeding the ewes. The ram may be put with the flock and allowed to run with them as practiced on the ranges. The best plan, however, is to keep him coralled during the day and turn him with the ewes during the evening or early morning. He will remain more active by handling in this way, and will care for a larger flock of ewes. The time of mating and the cross made will depend on the use or disposition that is to be made of the offspring.

Flushing Ewes.

It is a practice among some sheepmen to have the ewes in a rapidly gaining condition during the breeding season. Practice has demonstrated that ewes in this condition conceive more readily and drop a greater number of twins than when in a normal or run down condition. After the breeding season they should be kept in good flesh, but should not be made excessively fat. By so doing they will be better fitted to

go through the winter preparatory to lambing and caring for their offspring. Flushing on grain gives them new life and vigor which is important in nourishing a strong, healthy lamb.

Care of Pregnant Ewes.

One of the common faults in caring for pregnant ewes is to feed them either too sparingly or too heavily without sufficient exercise to foster the best bodily functions for the reproduction of strong, vigorous lambs. As far as possible natural conditions should be provided. The ewe barn should be light and airy and be sufficiently large to accommodate the flock without crowding. They should be sheltered especially from cold, penetrating winds, rain or snow.

Care should be taken to avoid misjudgment as to the condition of a ewe. With the long coat of wool it is not so easy to determine a run-down condition as in other farm animals. Ewes should come to the lambing period in the pink of condition, yet not burdened with fat. They should carry just enough flesh to insure the stimulation of a good milk flow on which depends the success of the lamb crop. Thin ewes make very poor mothers, often disowning their lambs. A condition of this kind is sure to result in failure and condemnation of sheep raising.

Range ewes having ample exercise seldom if ever give birth to weak lambs if they have been fed properly. Small, cramped barns and lots, lack of exercise and heavy feeding without regular exercise are the bane of the sheep industry.

Care of Ewes After Lambing.

At the approach of the lambing season it is a good plan to examine the condition of the ewes to see that they are thrifty and to determine if their udders are in good condition. The small locks of wool should be trimmed away from the teats to avoid hair balls which sometimes form from these locks in the stomach of the lambs. After the lambs show their ability to find the teats without aid the success of raising them is well in progress. For a time after birth they should be confined with the mother in a small pen to prevent them from getting lost in the flock. After a few days, however, they can be turned in the lots or pasture with the flock.

For a day or so after lambing the ewe will need little to eat except some pure water and bright clean hay. As the lamb develops and grows stronger the mother may be fed a light concentrated ration. Wheat bran is excellent for this purpose and somewhat later some crushed corn, oil meal, linseed meal or cottonseed meal may be added. For the ordinary sized ewe a pound per day and for very large ewes from a pound and one-half to two pounds of grain per day is ample for a large milk flow. If this is supplemented liberally with pasturage or silage the quantity may be reduced. The lambs should be kept growing as rapidly as possible without causing digestive troubles. Early lambs, if thrifty and fed properly, may be pushed and placed on the market before warm weather and thus the ravages of parasites will be avoided. If they are to be retained on the farm they should be weaned at three to four months of age, which will make it possible to put them on clean pasture away from the ewes before they have become infected. This will be of great practical aid in carrying the lambs through the summer without

becoming infested with parasites. Grazing on annual crops and a change of pasture are the best practical means known of overcoming this trouble. Tobacco dust and salt are used as a preventive or for the destruction of the worms after the sheep are infected. The use of gasoline is also recommended for this purpose. Medicated salt has been used with considerable satisfaction in treating stomach worms. A box containing some worm preventive should be kept in the lots or pasture where the sheep and lambs can have free access to it.

When the lambs are weaned the udders of the ewes should be looked after carefully until the milk flow is diverted. The ewes may then be turned on pasture, and there gain the larger part of their livelihood until breeding time in the fall.

Care of Young Lambs.

The sheep barns and other equipment should be in good repair before the lambing season begins. This is a critical stage with the flock and too much care and forethought can not be taken for the best results.



FIG. 7.—An improvised lamb creep.

The ewes heavier in lamb should be separated from the remainder of the flock, so that the closest watch can be kept of the arrival of lambs. In this way any assistance needed in lambing may be given and if the lambs are small and weak they should be thoroughly dried, put in a comfortable place, and given every assistance in getting their first milk. Lambs which are withheld from their first nourishment for any reason stand little chance to survive and make thrifty specimens. Ewes which disown lambs should be given a separate place where they will have an opportunity to get acquainted and possibly later they will claim their young. In the event they should not, after persistent attempts, it will be necessary to raise them by hand. Milk from the cow should be used and diluted about one-third with water. The utensils for feeding should be kept scrupulously clean to avoid scouring.

After the lambs once get well started and take the milk regularly, the feed of the ewe can be increased gradually until at the end of three or four weeks she should receive her full ration. The lambs should be induced to eat as early as possible to avoid a severe shock at weaning time. Ordinarily it will only be a very few days after birth until they will begin to eat grain and nibble at bright clean hay. It is advisable to build a creep in which the lambs can go, but to which the ewes will not have access. This is the English method, and there is no doubt regarding the art which they possess in sheep husbandry.

Weaning Lambs.

The lambs should be weaned when three to four months old. If they are properly fed in a creep where they alone can have access to grain and forage, there will be no further trouble at weaning time. For a time after the lambs are weaned the mothers should be given non-milk producing feeds. The legumes and green grazing crops, especially should be withheld. By withholding these feeds and allowing the lambs to suckle several times there should be no trouble with the udders unless it is with a very heavy milking ewe. If a lamb is allowed to return to a heavy milker she should first be milked out before the lamb is allowed to gorge itself and bring on digestive troubles.

Lambs which are to be sent to the market early in the season need not be weaned, but allowed to get every benefit of the mother's milk which will, when it is properly supplemented with grain and forage, give the lambs a full, plump appearance.

Winter and Early Spring Lambs.

There is no doubt but what a large number of farmers in this State could profit by buying a flock of grade ewes, cross them on a good pure-bred mutton ram and market the lambs during the early spring months. A good grade of ewes may be obtained from the mountains or from Chat-ham or surrounding counties at very reasonable prices. While the supply is limited, especially from the latter source, if more attention were given to sheep raising it would not be long until the supply of breeding females would be materially increased in numbers and in quality. The local markets throughout the State will handle a goodly number of lambs for spring trade. By having the ewes lamb the latter part of February or early in March the lambs can be placed on the market in May, June, and July usually at remunerative prices. The best ewe lambs may be retained and given special attention for the purpose of grading up the ewe flock.

The grade ewes necessary for producing spring lambs can usually be purchased for three to five dollars each, depending on their size, breeding and condition. Quite often the lambs will the first year more than pay for the original cost of the ewes and their keep, saying nothing of the value of the wool clip. If the ewes are extra good, they can be used for two or three seasons, after which the higher grade ewe lambs from the pure-bred ram will be coming into active service.

The winter lamb is a specialized product and the lambs coming in the middle of winter require much extra care and expense which is not necessary in raising the early spring lamb. Liberal prices must be re-

ceived for winter lambs to offset the extra cost of production; and usually the farmers of this State are not in a position to handle a specialized business of this kind. The winter or hot-house lamb is also a product of ewes specially adapted for early breeding, and it is not a usual thing for the mongrel ewes of the State to form this very early breeding habit. Until better foundation stock is secured and more specialized sheep farming is followed the writer believes the production of early spring lambs to be the most profitable line of sheep raising.



FIG. 8—Grade Shropshire lambs produced from native ewes crossed on a pure bred Shropshire ram.

Selection of Feeders.

The selection of feeding sheep at the central markets or from farms for the purpose of fattening for a later market has not been a common practice in this State, although in Virginia, Kentucky, and some other southern States this plan is followed to a limited extent. In the corn belt States large numbers of sheep are so fattened, often with profitable results. On the western ranges large central fattening plants are maintained, where sheep are fattened largely on alfalfa and corn.

This is a business which it pays to investigate thoroughly before going into it on a large scale. For the beginner it would be far better to maintain a few good grade ewes, cross them on a pure bred mutton ram and dispose of the lambs in the early spring, retaining the better females to build up the flock. Experience gained in this way would be very beneficial in getting into the sheep business on a larger scale. For the North Carolina farmer the writer believes it a better and a more con-

servative plan to keep a small farm flock instead of undertaking to buy feeders for subsequent marketing.

In the selection of feeders only good thrifty specimens should be purchased. They should be from good mutton stock, clear of eye and clean in fleece. A healthy sheep has a pink skin and a bright, lustrous wool. The unhealthy one has a white pale skin, a dead fleece, and the animal lacks in life and in vigor. The form of the feeder should be blocky, low-set, capacious, and not too heavy of wool, which often indicates a lightweight unprofitable feeder. These remarks will apply both to lambs and to wethers. Any one anticipating going into this phase of the sheep business should study thoroughly the demand for the product, the market condition and the grain feed and forage produced on the farm. If plenty of good, clean forage is available at a reasonable price this business may be made a profitable one. It is very likely, however, that this plan of sheep farming will not develop rapidly since the supply of desirable feeders is very small, owing to the small number of sheep of all kinds produced in the State.

Marking.

There are various methods in use for marking pure-bred sheep. The button or band in the ear bearing the flock number, the breeder's initials and the registry number of the recording association are quite generally used. The objection to this method is that the buttons or bands are often pulled out and the identity of the sheep lost.

The notch system, used more frequently in hogs, is sometimes used, but the ear of the sheep being small the marking may disfigure it which makes this system to some very objectionable.

Paint used on the wool is injurious and the identity sooner or later becomes lost through fading or shearing of the flock. This method is sometimes used to mark ewes during the breeding season to determine the time when they were bred.

The tattoo marker is the most satisfactory. This consists of a hand-pincer with a frame in the jaws of which may be inserted needles from which the initials of the breeder may be made. These needles are covered with a special kind of India or indelible ink, either white or black, which is impressed in the ear. The pincers should be properly adjusted, else the initials will not be clear and perfect. In England this method of marking is used extensively.

Shearing and Tagging.

Usually sheep are sheared once during the year. Some few breeders practice shearing both in the spring and early fall, but by so doing the value of the staple is decreased, owing to the shortness of the fiber. Sheep should be relieved of their wool in the spring as soon as weather conditions will permit. If the ewes lamb early it is better to leave the wool on until after lambing; however, a careful flockmaster can shear them earlier without doing them injury. The wool should be clipped close and uniformly, either with hand shears or with a machine. The latter can be used by the beginner to better advantage, however, a large number of sheep, forty to fifty, can be sheared by hand in one day if one is expert at the business.

The shearing should be done in a light, clean place, preferably on a smooth wooden platform, or on a canvas cloth to keep the fleece clean. Sheep should never be tied or held by the horns while being sheared. They should be turned upon the buttocks with the head and shoulders resting against the shearer. The wool should be opened on the belly and clipped away carefully, keeping the skin drawn tightly at all times. By so doing there will be no danger of cutting the skin.



FIG. 9—Showing position to hold a sheep to keep the skin drawn tightly while shearing.

After the wool is removed all the filth and tags should be removed. The fleece is then rolled up, the loose fibers and ends being turned toward the center, leaving the cut side of the fiber out. If the wool is carefully clipped, wrapped and tied it will add considerably to its appearance and value. Wool should never be tied with anything except the wool itself, or with regular fleece twine, the best of which is made from paper. This latter being light in weight does not add to the weight of the wool. Binder or sisal twine of any kind should never be used, as the fibers of the twine become mixed with the wool and detract from its value. Sometimes a loss of as much as four or five cents per pound in the raw wool is sustained from this cause. Wool coming from certain territories is at times greatly discriminated against because of this condition.

Tagging or removing the particles of manure which collect in the wool should be done often to prevent sheep from getting in a filthy condition. Even when properly docked they will often accumulate droppings in the wool which become very offensive and disagreeable. By the use of the hand shears a large number of sheep may be gone over in a short time much to their comfort and appearance.



FIG. 10—A fleece properly tied without the use of binder or sisal twine.

Keeping the Flock Healthy.

In keeping the flock healthy, the feeding can not be too much emphasized. Sheep will subsist largely on rough feed, such as leguminous hays and roots. Too much concentrated feed, especially for sheep not in the habit of getting it, may cause serious digestive troubles. Native sheep should be brought gradually to their grain ration, as sudden increases are very likely to cause loss in the flock. Lambs especially should be carefully handled to prevent digestive troubles. Although they should be pushed for market they should be brought gradually to their full ration.

The pastures should be changed often to prevent infection from stomach worms and succulent feed should be supplied as much of the time as possible. During the winter corn silage and roots should take the place of summer pasture.

Dead carcasses should be burned, as they often harbor parasites which pass part of their life in other animals which may visit these places and spread or prolong the trouble. Sheep brought from other flocks should be examined carefully for disease and parasites, as they are likely to infect the entire farm flock if they are diseased. If the ewe lambs retained to replenish the flock have been supplied with a rotation of pasture where infected sheep have not been allowed for at least one year or since cultivation for seeding, a healthy flock will be assured.

Dipping the Farm Flock.

The dipping tank can not only be used for sheep but for hogs and young calves as well, so that the entire outlay need not be charged up against the sheep. Dipping is especially valuable in overcoming the ravages of scab, lice and ticks, but it will also prove beneficial in preventing eye, nose and mouth troubles. If regular dipping is practiced it will not only prevent to a large extent many of the ravages common to sheep, but it will maintain the flock in a much better state of general healthfulness.



FIG. 11—The Station farm dipping tank in use.

There are a number of proprietary dips on the market which can be used successfully and at a moderate cost. Standard dips of this kind are generally used in the proportion of one part of dip to forty parts of water, making a two and one-half per cent solution. The best and most effective time to dip sheep is in the spring, about ten days after shearing. It will take much less of the solution and be far more effective. Dipped in this way the sheep can be put through the tank very rapidly, while if they are dipped for scab or while the wool is on they should be immersed several times and held under excepting the head from one and one-half to two minutes. In case of sheep scab the scabs should all be loosened, so that the dip will thoroughly penetrate the exposed parts.

The dipping tank can be made of wood, galvanized iron, or concrete. The concrete tank will last indefinitely and is the most economical type

in the end. The galvanized tank can be purchased on the market at a moderate cost.

In the actual construction of a dipping tank the aim should be to provide for efficient dipping and still not have the tank so large as to require an excessive amount of dip. If properly constructed the saving of dip will prove to be an item during the season.

The ordinary galvanized iron tank is the one in most common use, but it is not as lasting as a tank built of brick and then cemented, or the solid concrete vat built in a mould or form. This latter tank will cost somewhat more, but will last for a lifetime, and there will be no danger of bulging or leaking if the masonry work has been properly done. A tank ten feet long at the top, four feet long at the bottom, twenty inches wide at the top and eight inches wide at the bottom, and four one-half feet deep will answer every purpose. The tank should be set four to eight inches above the ground to keep out surface drainage and filth, the admission of which would weaken the disinfectant, and make it very disagreeable in dipping sheep. All necessary equipment for dipping should be located convenient to the yards or lots where the majority of the stock is kept. This will admit of more frequent dipping and at much less trouble and expense. The animal should be dropped buttock first directly into the disinfecting solution. A draining floor should be provided. If sheep are dipped with the wool on they will carry considerable dip from the tank and make the operation more expensive. By building a fence around the drain leading back into the tank the sheep can be held there for a short time and thus save much of the liquid carried out in the wool. Where large flocks are being dipped it will be advantageous to divide the draining pen into two equal parts, having a swinging gate at the end of the partition next to the outlet end of the tank. This gate can be swung to either side, thus closing one of the pens and allowing one side to be filled with sheep to drain while the other side is being filled. By alternating in this way much greater headway can be made.

Castration and Docking.

Both of these operations should be performed early in the life of the lamb, as it will not only avoid pain but the wounds will heal quicker. When the lambs get started after these operations there is nothing to prevent their going on rapidly to maturity. It is necessary to dock early in order to avoid the filthy condition in which undocked lambs usually get. It is customary to do the docking first. It may be done most any time, however, after the lambs get well started growing.

Several methods of docking are in use. The simplest one is to draw the skin back close to the root of the tail, tie a string tightly around and sever the tail from the under side with an ordinary knife just below the portion encircled by the string, and where the skin has been drawn back. Another method is to use an ordinary mallet and chisel, severing the tail on a block. With this method also it is best to stop the blood flow by the use of a string just above the part severed or by the use of a searing iron.

The safest plan is to use a pair of docking pincers or a docking iron, which can be procured from a sheep supply house, or it can be made by

any blacksmith in an emergency. The pincers or docking iron are heated red hot, the tail is run through a hole in a board and then severed by the pincers or iron just below the board which partially protects the remaining portion of the member from the heat of the instrument. By this method there is no bleeding and consequently no danger whatever, whereas by other methods a lamb sometimes bleeds profusely. If for any reason a mature sheep is to be docked, the docking pincers or searing iron should be used. Some good disinfectant material, such as that used in dipping, should be applied after the tail is severed. In warm weather every precaution should be taken to see that the stump tail does not become infested with maggots.

The castration of lambs should likewise be performed early. The operation is simple. The lower end of the scrotum is cut off, the testicles forced down through the openings, after which they are pulled out with a portion of the cords adhering. After the operation a mixture of lard and turpentine or other good disinfectants should be applied to the wound. In castrating old rams the safest way is to use the hot docking iron, severing the entire portion of the scrotum containing the testicles. By this method the arteries are seared by the heat and there is no danger of excessive bleeding. In both castration and docking great care should be taken to use tools which are thoroughly disinfected before use.

Constipation.

Constipation is usually the result of injudicious feeding or the lack of succulence in the ration. Roots, silage or oil meal are indispensable in preventing this trouble. This trouble in lambs is generally brought on by improper feeding of the ewe. Rations which are inclined to be heating or excessively fattening should be avoided. These troubles are likely to come on during the winter season, when succulent feeds are not available and when heavier grain feeding is practiced. With lambs, constipation may be very detrimental and cause heavy losses in the flock. The symptoms of constipation are dullness, sleepiness and loss of appetite. A rectal injection of raw linseed oil or soapy water will usually relieve the condition. If the lambs are affected the ration of the ewe should be corrected, and the lamb should receive a dose of castor or linseed oil.

Stomach Worms.

One of the most dreaded diseases of the sheep farmer is the stomach worm, which is very fatal to young lambs. Fortunately the stomach worm thrives only during warm weather and under rather moist soil conditions. This fact can be used to advantage by having the lambs come early and sell them before the stomach worm has a chance to thrive. This is one important argument in favor of the early lamb in this State where worms will likely give trouble if proper management and preventives are not used. While these worms are common in mature sheep they do not cause the great emaciation and high mortality here as in young lambs. The worms are matured in the sheep, from which the eggs produced finally pass and are scattered over the pasture. Afterwards they hatch and find their way into the stomach of the lambs. Here they develop and generally cause serious trouble.

One of the most practical methods of overcoming this pest is to have the lambs come early. They should then be weaned before the advent of warm weather, during which the worms will begin to develop. After the lambs are taken from the ewes they should be placed on a non-infected pasture, be well fed and kept until marketed. Frequent change of pasture, even during this short stage of development is effective.

Care of Feet.

Sheep kept on rough rocky soil ordinarily keep their feet in good condition. However, on the arable farm where there is nothing to cause a natural wearing, the hoof should be kept trimmed to prevent deformed feet. If the natural wear does not keep the hoof in good condition it will be well to trim the feet before going to pasture in the spring. The hoof can be very greatly softened by allowing the sheep to run through damp grass. When worked on in this condition they will cut much easier than otherwise. The hoof should be kept short and straight, to prevent a crooked foot or leg.

One of the most common diseases of the foot is known as foot-rot or foot-scald. Any indication of this trouble should be looked after at once. All the diseased parts should be kept cut away and exposed to the action of a disinfecting solution. This disease in the simpler form can be treated quite successfully by a solution of some coal-tar disinfectant or with carbolic acid. When the disease has become deep-seated, however, more careful and persistent measures should be used. The diseased parts should be thoroughly exposed by frequently trimming away all such tissue and disinfected with a strong solution of copper sulphate. If the parts have been cut away to any extent the foot should be bound up and the animal kept in a dry, clean place until a cure is effected. Wing recommends the use of a trough, about ten feet long, six inches wide at the bottom, twelve inches wide at the top and six inches deep. This is placed in the passage-way from the barn to the lot in such a way that the sheep are compelled to walk through it in going to and from the barn. The trough should be partly filled with whitewash to which is added copper sulphate solution in liberal amounts. This is an effective remedy, especially if the disease is discovered and treated in the incipient stage.

Caked Udder.

Caked udder is likely to give trouble in a heavy milking flock of ewes if proper care is not given. This may happen early after the birth of the lamb by too rapid forcing of the ewe or at weaning time when the feed of the ewe is not properly changed or reduced and the excess of milk drawn from the udder. For several days after weaning the ewes should be kept milked out and by properly reducing the feed the milk flow can be checked. In a bad case of caked udder the ewe should be well sheltered, the udder bathed in hot salt water, and a mixture of lard and turpentine applied.

In case of garget of the udder, which is sometimes brought on by cold and exposure, purgatives should be given, the udder bathed, and camphorated oil or lard and turpentine applied. If an abscess forms it should be opened and kept well washed out with a good disinfectant, such as a weak solution of carbolic acid or creolin.

Bloat.

Sheep should never be allowed to pasture on clover, alfalfa, or rape when they are especially hungry. They should first be given dry roughage and then be turned on the pasture, but only for a short time each day until they become accustomed to the change. If precaution is not taken in this matter the sheepman will likely have a bad case of bloat on his hands.

To relieve this trouble tap the stomach on the left side at the point where the distention is greatest, which will be midway between the backbone, the point of the hip bone, and the last rib. A pocket knife can be used for the purpose, but a trocar is best. This instrument not only makes the incision but the cannula or sheath keeps it open in such a way that the gas can readily escape.

Purgatives should be given to otherwise relieve the congested condition of the animal. Linseed oil is very desirable for this purpose. In an acute attack of bloat three drams of hyposulphite of soda and one dram of ginger mixed in water will usually prove very helpful.